

LDWSF  
12.3.4/2.1  
10-15-02



Kleinfelder, Inc.

Memorandum

DATE: October 15, 2002  
TO: Dan Cargill/Ecology  
FROM: Scott Dwyer  
RE: Soil Concentrations of Arsenic at Long Painting Facility

The purpose of this memorandum is to demonstrate that the arsenic concentrations in the subsurface soil at the Long Painting facility at 8025 - 10<sup>th</sup> Avenue South, Seattle, are in compliance with the Model Toxics Control Act (MTCA) Method A soil cleanup levels.

The soil investigation completed at the Long Painting facility included 17 samples analyzed for total arsenic. The soil samples were collected across the site at depths ranging from ground surface to four feet below ground surface (Kleinfelder 2000). A depth of four feet was selected because Kleinfelder hypothesized, and Ecology concurred, that the most likely locations for soil contamination to be found was adjacent to storm drain sumps located across the facility. The sumps are completed at a depth of approximately four feet.

Analysis of the 17 soil samples from the subject site revealed the presence of arsenic at a maximum concentration of 21 mg/kg (soil boring SB-3-1 collected from a depth of four feet). This concentration exceeds the MTCA Method A soil cleanup level of 20 mg/kg. Compliance with MTCA can be demonstrated, however, based on WAC 173-340-740 (7)(e) which states:

- No single sample concentration shall be greater than two times the soil cleanup level;
- Less than ten percent of the sample concentrations shall exceed the soil cleanup levels; and
- The upper confidence interval on the true soil concentration is less than the soil cleanup level. Statistical tests shall be performed at a Type I error level of 0.05.

The following statistics were developed from the analytical laboratory reports for soil samples collected from the subject site:

USEPA SF



1410115

Number of soil samples analyzed for arsenic	17
Number of soil samples containing detectable concentrations of arsenic	17
Minimum arsenic concentration	1.7 mg/kg
Maximum arsenic concentration	21 mg/kg
Mean arsenic concentration	5.5 mg/kg
95 <sup>th</sup> percentile upper confidence limit (Land's Method)	7.63 mg/kg

Based on these statistics, we can demonstrate that:

- (1) No single sample concentration is greater than two times the soil cleanup level. The maximum concentration was 21 mg/kg, which exceeds the cleanup level by only 1 mg/kg.
- (2) Less than ten percent of the sample concentrations exceed the soil cleanup level of 20 mg/kg. Only one of 17 samples exceeded the arsenic cleanup level, which is only 6%.
- (3) The upper confidence interval on the true soil concentration is less than the soil cleanup level at a Type I error level of 0.05. Using Ecology's MTCASat software, we calculated the 95<sup>th</sup> percentile upper confidence limit of the arsenic concentration to be 7.63 mg/kg, which is well below the Method A soil cleanup level of 20 mg/kg. The report from the MTCASat program is shown below (Figure 1).

Figure 1. MTCASat Report for Arsenic in Soil at Long Painting

Long Painting Company - Arsenic concentrations in soil.

Number of samples		Uncensored values	
Uncensored	17	Mean	5.50
Censored		Lognormal mean	5.40
Detection limit or PQL		Std. devn.	4.6413699
Method detection limit		Median	4
TOTAL	17	Min.	1.7
		Max.	21
Lognormal distribution?		Normal distribution?	
r-squared is:	0.949	r-squared is:	0.676
Recommendations:			
Assume lognormal distribution.			
W value is 0.9549. This exceeds the tabled value of 0.892			
UCL (Land's method) is 7.63320528816703			

We conclude that the concentration of arsenic in the soil at the Long Painting facility is in compliance with MTCA and further investigation or remediation is not necessary.

#### Reference

Kleinfelder. 2000. Site Investigation Report, Long Painting Company, 8025 - 10<sup>th</sup> Avenue South, Seattle, Washington. Prepared for Long Painting Company. Prepared by Kleinfelder, Inc., Bellevue, Washington. Kleinfelder Project Number 60-204601.